

What we claim is:

1. An article comprising a machine-accessible medium having stored thereon instructions that, when executed by a machine, cause the machine to:
  - obtain, from a performance monitor, performance data for a memory heap having a plurality of memory regions;
  - based on the performance data, determine if at least one of the plurality memory regions is a delinquent region; and
  - in response to a determination that at least one of the plurality of memory regions is a delinquent region, execute a memory management routine to optimize that region of the memory heap.
2. The article of claim 1, wherein the performance data represents at least one memory performance event..
3. The article of claim 1, wherein the performance data is selected from the group consisting of cache misses, translation lookaside buffer misses, branch mis-predicts, stalls due to data dependency, and data cache write-back.
4. The article of claim 1, wherein the performance monitor is a Performance Monitoring Unit (PMU).
5. The article of claim 1, having further instructions that, when executed by the machine, cause the machine to:
  - execute the memory management routine on at least one delinquent region; and

execute a secondary memory management routine on at least one non-delinquent region, wherein the secondary memory management routine is different than the memory management routine.

6. The article of claim 1, having further instructions that, when executed by the machine, cause the machine to:

execute a garbage collection routine on at least one delinquent region.

7. The article of claim 6, wherein the garbage collection routine is selected from the group consisting of reference counting collection, copy collection, generational collection, mark-sweep collection, beltway collection, oldest first collection, slide compaction or a hybrid collection.

8. The article of claim 1, having further instructions that, when executed by the machine, cause the machine to:

establish a size granularity of the memory region prior to obtaining the performance data for the memory region.

9. The article of claim 1, wherein the performance data is received from a Performance Monitoring Unit, having further instructions that, when executed by the machine, cause the Performance Monitoring Unit to:

count the number of occurrences of the performance data.

10. The article of claim 9, having further instructions that, when executed by the machine, cause the Performance Monitoring Unit to:

compare the count of the number of occurrences of the performance data to a threshold value, wherein if the count is above the threshold value, a delinquent region is determined to exist.

11. The article of claim 10, having further instructions that when executed by the machine, cause the machine to:

determine if a sufficient number of data samples have been taken, before comparing the count to the threshold value.

12. The article of claim 10, having further instructions that, when executed by the machine, cause the machine to:

in response to a determination that an additional data sample is to be taken, collect the additional data sample from the memory heap.

13. The article of claim 1, having further instructions that, when executed by the machine, cause the machine to:

block the delinquent region from memory storage.

14. A method comprising:

identifying load miss memory addresses from a memory heap including a plurality of memory regions;

maintaining a frequency count for the identified load miss memory addresses;

determining if any of the plurality of memory regions include a threshold value of load miss memory addresses; and

optimizing the memory heap in response to a determination that at least one of the plurality of memory regions includes a threshold value of load miss memory addresses.

15. The method of claim 14, wherein optimizing the memory heap comprises blocking the memory regions including the threshold value of load miss memory addresses.

16. The method of claim 14, wherein optimizing the memory heap comprises performing a garbage collection on at least one of the memory regions including the threshold value of load miss memory addresses.

17. The method of claim 16, wherein the garbage collection optimization is selected from the group consisting of the group consisting of reference counting collection, copy collection, generational collection, mark-sweep collection, beltway collection, oldest first collection, slide compaction or a hybrid collection.

18. The method of claim 14, further comprising:  
performing a first memory management routine on at least one memory region including the threshold value of load miss memory addresses;  
and

performing a second memory management routine, different than the first memory management routine, on at least one memory region that does not include the threshold value of load miss memory addresses.

19. A system comprising:  
hardware to monitor performance of a memory heap and to compile performance data on memory regions within the memory heap, wherein the hardware is able to determine if any of the memory regions are delinquent regions based on the compiled performance data; and a memory manager for optimizing the delinquent regions.

20. The system of claim 19, wherein the hardware comprises a performance monitoring unit, and wherein the memory manager is a garbage collector.

21. The system of claim 20, wherein the garbage collector executes a garbage collection optimization selected from the group consisting of reference counting collection, copy collection, generational collection, mark-sweep collection, beltway collection, oldest first collection, slide compaction or a hybrid collection.